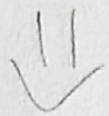


Ex 1 LINEARIZAÇÃO de $f(x) = \cos(x)$



$$f(x) = \cos \bar{x} - \text{Sen} \bar{x} \cdot (x - \bar{x})$$

Com $\bar{x} = 0$ temos:

$$\hookrightarrow f(x) = \cos(0) - \text{Sen}(0) \cdot (x)$$



$$f(x) = 1$$

Com $\bar{x} = \frac{\pi}{4}$ temos:

$$f(x) = \cos \frac{\pi}{4} - \text{Sen} \frac{\pi}{4} \left(x - \frac{\pi}{4} \right)$$



$$f(x) = \frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2} x + \frac{\sqrt{2} \pi}{8}$$

Ex 2:

$$F(t) = m\dot{v} + mru - m\dot{x}r = f(u, \dot{v}, r, \dot{r}, x)$$

$$f(u, \dot{v}, r, \dot{r}, x) = f(\bar{u}, \bar{\dot{v}}, \bar{r}, \bar{\dot{r}}, x) + *$$

$$* = \frac{\partial f}{\partial u} (u - \bar{u}) + \frac{\partial f}{\partial \dot{v}} (\dot{v} - \bar{\dot{v}}) + \frac{\partial f}{\partial r} (r - \bar{r}) + \frac{\partial f}{\partial \dot{r}} (\dot{r} - \bar{\dot{r}}) + \dots$$

$$\frac{\partial f}{\partial x} (x - \bar{x})$$

\Rightarrow

Como $\bar{\dot{v}}, \bar{r}$ e $\bar{\dot{r}} = 0$ temos

$$-m\bar{u}r + m\bar{x}\dot{r} + F(t) = m\ddot{v}$$